

Description of muTr Calibration DAQ and Analysis Procedures – MJL – 10/7/04

DAQ

- on phnxrc@phnosc:mutr/calib/
- the shift-person is supposed to initiate this whole thing (by using docalib.pl) at least once a day when the beam or HV are off and normal data taking not taking place.
- docalib.pl – Perl/Tk GUI to control calibration of either arm
 - calib1.pl – Perl script called by above for init, each of 13 DAC values and finishing up. For each 13 runs:
 1. Set calibration system amplitude & packets user words using calib.c program
 2. Then use RC to take >100 event run
 - prdf file names are recorded in the file filelist_xx_yy_zz.txt
 - After a successful end it puts “tag” name into newcalibS.txt or newcalibN.txt (which is the signaling file to the automatic analysis, see below)
 - And last call getTemp.csh to readout and check FEM/Glink temperatures, voltages, currents and put in mySQL database

Automatic Analysis

- On phnxmutr@va011 in ~/calib
- cauto (cautoped) – cron jobs (one for south, one for north) run every 5 minutes and look for newcalibX.txt files in the DAQ directory (above). When one is found it initiates an analysis automatically by calling docalib.
- docalib (doped) – csh script to analyze a set of calibration runs for a muon arm (south or north)
 - sets LD_LIBRARY_PATH to get working libraries
 - makes a sub-directory for this analysis using the “tag” name
 - get filelist_xx_yy_zz.txt from DAQ directory
 - calib.C (quick.C) – root macro to analyze all data for calibration & produce threshold files
 - plot.C – root macro to plot calibration results
 - mon/... - comparison macros/programs to compare these results with results from previous calibrations & make some plots
 - check.pl - sanity checks before recording anything in db
 - copy new threshold files to \$DCM_THRESHOLDS/mutr.s or mutr.n
 - update database
 - use domove to update results & histograms on Web via Samba mount of /phenix/WWW & at /data2/phnxmutr/www/calib_results
 - email results to leitch (& others)
 - call dobits.csh which analyzes calibration prdf files for stuck bits
 - in directory ~/dobits/ using dobits.csh, check_mutr.C and check_stuck_bit
 - new web areas on logbook.phenix.bnl.gov that can be reached via tunneling to port 80 on logbook (7299 tunnel port number here)

- http://127.0.0.1:7299/mutr/calib_results/calib_results.html
- <http://127.0.0.1:7299/mutr/www/>
- <http://127.0.0.1:7299/dallas/>

Analysis Code Overview

- code in CVS @ Development/online/calibration/Run3/subsystems/mutr/
- calib.C – macro called by docalib (or calibX.C where X is S or N)
 - load libraries: libonlreco.so & libMutCalib.so
 - create MutCalib object
 - initMappingObj or txtGetFullMap – get channel mapping
 - getPreviousCalibration – get most recent previous calibration results
 - txtputMap
 - process_tag
 - loop over 13 prdf files
 - process_run
 - process_event – stores adc values internally
 - calcCalibVal
 - calc avg
 - calc rms
 - calc for DAC=0
 - $\text{thresh} = (\text{avg-nrms} * \text{rms} - 0.5) \wedge 0\text{xffff}$
 - writeThreshFiles – write out thresholds into files formatted for DCM's
 - rootPutInfo
 - fit – fit for pedestal, linear and non-linear gain vrs input pulse size (DAC) description
 - txtPutCalib – put resulting desription for each of ~22k channels/arm in text file
 - writeROOTFile – write ntuple that's useful for debugging or looking at more detail
- building libMutCalib library in phnxmutr@va032:/data2/phnxmutr/mjl/online/
 - presently using new
 - cd /data2/phnxmutr/mjl/
 - mkdir build source install
 - cd source
 - cvs co online/calibration/Run3
 - cd build/online
 - ../../source/online/calibration/Run3/autogen.sh --prefix=/data2/phnxmutr/mjl/install
 - make -j 4 install in each relevant subdirectory (since bbc won't compile)
 - i.e. mutr, reco, ?